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How does greenwashing influence managers' decision-making? An experimental approach under stakeholder view

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Abstract

Greenwashing is a communication practice that consists of the deliberate and voluntary disclosure of environmentally misleading (or even false) information by a firm and which the public understands to be deceptive. Although prior literature analyzes greenwashing effects from the greenwasher perspective, the underlying perceptions of managers in the decision-making process related to maintaining (or contracting a new) a commercial partner, client, supplier, or other stakeholder who is a greenwasher, remain underexplored. This work empirically examines how greenwashing could influence managers' decision-making and whether a moderation effect of attitude toward environmental management exists in this relationship. In doing so, this work relies on experimental design.

KEYWORDS

experimental design, green attitude, greenwashing, managerial decision, moderation, stakeholder engagement

1 | INTRODUCTION

At the end of January 2018, the media revealed an environmental scandal involving the German automotive group Volkswagen. The European Research Group of the Environment and Health in the Transport Sector (EUGT), a research organization funded by the Volkswagen Group, Daimler and BMW, had funded experiments using monkeys and humans in 2014 (Mühlauer, Brüssel, Dodt, Hägler, and Ott, 2018; Ewing, 2018). In the experiments, both monkeys and humans inhaled gases from diesel and gasoline vehicles over a period of time, and scientists then compared the harmful effects in both scenarios. The objective of these experiments was to demonstrate that new diesel vehicles were cleaner than older models, without considering how unethical the experiments were. In addition, a scandal known as Dieselgate preceded this incident, in which the automotive company developed illegal software that manipulated emissions to evade legal standards (Ewing, 2018). Volkswagen's objective in this deceptive manipulation (Siano, Vollero, Conte, & Amabile, 2017) was to announce that its vehicles complied with the Clean Air Act in the United States, to promote the idea that the company produced less-polluting vehicles, and thus, to sell more diesel cars in an American market dominated by gasoline vehicles. Both environmental scandals at Volkswagen exemplify greenwashing, defined as the selective disclosure of environmental information by companies, concerning practices that exclusively portray positive environmental performance (and even hide practices with poor environmental performance), intending to project a positive corporate environmental image (Bowen, 2014; Delmas & Burbano, 2011; Lyon & Montgomery, 2013). However, despite these greenwashing practices, the Volkswagen Group was the largest automaker according to sales volume in 2018 and 2019, with more than 10.3 million units sold in 2019. This circumstance encourages reflection: is it possible that the behavior of a greenwasher does not affect its corporate image, and therefore, its relations with stakeholders? In this work, we examine this topic by analyzing greenwashing effects from the perspective of managers' perceptions in their decision-making process.

In the academic arena, Lyon and Maxwell (2011) provided the first economic model regarding greenwashing. Several studies have empirically analyzed greenwashing and its relationship with firm variables, including its effect on firm profitability (e.g., Walker & Wan, 2012), or its influence on firm communication strategies (e.g., Guo, Tao, Li, & Wang, 2017; Mahoney, Thorne, Cecil, &

LaGore, 2013), among other relations. However, several important aspects concerning how managers perceive greenwashing in the decision-making process remain unexplored in the academic literature. Prior literature has focused on how the existence of perceived greenwashing could affect the consumers' or the general public's decision making. For instance, de Vries et al. (2015) analyzed the general public's tendency to be suspicious of the greenwasher behavior of companies in the energy industry. Similarly, several researchers (e.g., Nyilasy, Gangadharbatla, & Paladino, 2014; Szabo & Webster, 2020) have studied how perceived greenwashing, through green advertising, could affect the consumers' reactions and their purchasing decisions. Nevertheless, the perceived effects of greenwashing and how they affect the decision-making skills of managers have not been previously studied in depth. Furthermore, Torrelli, Balluchi and Lazzini (2020) analyzed whether the existence of misleading communications about environmental issues affects the stakeholders' perception of the company. But how is this relationship perceived from managers' point of view? In other words, would managers be willing or not willing to maintain or initiate business relationships with stakeholders who were greenwashers or brownwashers? The answers to these questions are the main novelties of this study and it attempts to contribute to prior literature on the symbolic environmental behaviors, in general, and on greenwashing, in particular. In other words, current wisdom has examined greenwashing from the perspective of the greenwasher, but few studies examine the effect of greenwashing on managers when they perceive that external stakeholders (e.g., their commercial partner, client, or supplier) is a greenwasher. In this study, the focus is on analyzing if one-half of a business relationship, that is, being a greenwasher, can influence the managerial decision making of the other half. We also examine whether the general attitude toward the importance of environmental management could moderate this effect.

The analysis of managerial perceptions, attitudes, and decisions is highly complex. This is because when questioning managers about these types of variables, it is difficult to isolate the effect of specific opinions or perceptions from more general individual values. To address this methodological problem, we proposed to test the relationship using an experimental procedure. Experiments in management research help correctly assess the direction of causality between two (or more) variables (Chatterji, Findley, Jensen, Meier, & Nielson, 2016). Using this methodological device, researchers can randomly assign subjects to a specific treatment and control group that they are interested to analyze and isolate from other treatments or effects (Chatterji et al., 2016; Delmas & Aragón Correa, 2016). We consider that this manipulated isolation is crucial for determining the underlying factors in managerial decisions, given the existence of perceived greenwashing. Consequently, the objective of this study is to analyze the relationship between greenwashing and managerial decisions and to determine whether the "green" attitude of individuals might moderate this relationship. In doing so, this study proposes an experimental procedure based on both stimuli and items previously tested in the literature.

2 | THEORETICAL REVIEW

2.1 | Greenwashing concept

The greenwashing concept has been defined by several authors, (e.g., Furlow, 2010; Mitchell & Ramey, 2011; Ramus & Montiel, 2005) and according to the Oxford English Dictionary, as "disinformation disseminated by an organization so as to present an environmentally responsible public image." Although there is no explicit reference of the intentions of the greenwashing practices in this definition, it shows that it is a deliberate action due to two connotations. On the one hand, greenwashing practices have an objective to achieve a responsible public image; then, greenwashing practices are implemented with the intention of presenting a false/misleading image that the organization is green. On the other hand, "disinformation" implies a heavy connotation of deliberate false information. That is why, from this definition, it is possible to assume that greenwashing is deliberate and intentional. In this sense, Mitchell and Ramey (2011) affirmed that greenwashing comes from the combination of two concepts: green and brainwashing. These connotations have pushed other authors to define the concept in a different way by adding some other overtones. One of the most widely accepted definitions is that of Lyon and Maxwell (2011), who defined greenwashing as "the selective disclosure of positive information about a company's environmental or social performance, without fully disclosing the negative information on these dimensions, so as to create an overly positive corporate image" (p. 9). These authors understand greenwashing as the disclosure of only environmental successful information while remaining silent when this information is not in their self-interest. In this case, the intentional aspect is still present in the definition, but the "disinformation" connotation has been deleted. In their theoretical work, Delmas and Burbano (2011) emphasized that greenwashers simultaneously combine two firm behaviors, as follows: having poor environmental performance and communicating positively about it, which seems to agree with the symbolic and deliberate action of greenwashing. Furthermore, Bowen (2014) considered greenwashing a subset of communication activities within a broader theoretical component, symbolic corporate environmentalism, which is defined as "a set of meanings and representations that are shared in the environment and put in place by managers within organizations for environmental reasons" (Bowen, 2014, p. 31). Bowen (2014) summarized three cornerstones that prior studies have considered regarding greenwashing: it should (a) focus on disseminating selective corporate information, (b) be a deliberate option, (c) be an activity initiated and managed by the firm (Bowen, 2014). The author concludes with two main ideas: greenwashing is a "merely symbolic" and deliberate action. In addition, other studies have indicated a fourth cornerstone regarding external accusation (de Vries, Terwel, Ellemers, & Daamen, 2015; Seele & Gatti, 2017), that is, for greenwashing to occur, it is necessary to "be co-constructed in the eye of the beholder" (Seele & Gatti, 2017, p. 239). However, despite the fact that one of the main cornerstones of greenwashing is that it must be perceived by "the eye of the beholder" (Seele & Gatti, 2017), some

companies could be greenwashing unintentionally. For example, Heras-Saizarbitoria, Boiral and Díaz de Junguitu (2020) considered that companies sometimes use an environmental certification to comply with certain requirements and for auditing purposes. In such instances, companies are not fully interested in misleading or hiding negative information, but is rather carrying out certain environmental practices in a symbolic way (Ferrón-Vílchez, Darnall, & Aragón Correa, 2017) to comply with the legislation or with the requirements of certain stakeholders, mainly regulators, customers and suppliers (Ferrón-Vílchez et al., 2017; Heras-Saizarbitoria et al., 2020). Although the definitions of greenwashing differ, since the connotations regarding its intentions have been changing over time, we consider that greenwashing complies with four main assumptions: it involves the (a) voluntary disclosure of misleading (or even false) environmental information that must (b) be planned (c) be initiated by the company and (d) be understood as misleading by the public.

2.2 | Greenwashing under stakeholders' engagement view

Although the definition of greenwashing is still scattered, and a debate exists in the literature about how these practices are developed by companies, we consider greenwashing as a group of symbolic environmental practices born in response to the stakeholders' pressures (Albertini, 2014; Chiu & Wang, 2015; D'Amico, Coluccia, Fontana, & Solimene, 2016; Huang & Kung, 2010; Velte, 2020). The integration of the stakeholders' needs into the strategy of the organizations could be explained by the so-called stakeholders' engagement. This concept, also known as stakeholders' integration capacity, was defined by Sharma and Vrendenburg (1998) as "the ability to establish trust-based collaborative relationships with a wide variety of stakeholders" (p. 735). According to this concept, firms develop a strategic gradual process through the stakeholders' engagement mechanisms with the objective of obtaining information about the stakeholders' environmental interests and expectations, which also allows stakeholders to participate in the firms' environmental decision-making process (Garcés-Ayerbe, Rivera-Torres, & Suárez-Perales, 2019). This process of integrating the stakeholders' interests into the firm's environmental strategy could sometimes result in the firm's adaptation of the stakeholders' requirements through proactive or advanced environmental practices (Ferrón-Vílchez et al., 2017; Murillo-Luna, Garcés-Ayerbe, & Rivera-Torres, 2008). Other times, the result of the stakeholders' pressure could be a misleading disclosure of the green actions. In other words, in these cases, the stakeholders' demands could result in a reactive response. Several firms could be motivated to be greenwashers as a reactive response using which the company can shield itself (at least until its intention is discovered, thus breaking down the trust-based relationship) from the external stakeholders' pressures, especially when the firms operate in "environmentally sensitive" or polluting industries (Cho & Patten, 2007). Prior literature indicates that the level of external pressures perceived by the greenwasher could explain the motivations for adopting this symbolic environmental approach. This level differs depending on several factors, such as the sector in which the firm operates (de Vries et al., 2015; Ramus & Montiel, 2005), level of stringency of political scrutiny concerning environmental issues (Marquis, Toffel, & Zhou, 2016), or a firm's environmental performance before planning greenwashing (Cho & Roberts, 2010; Cho & Patten, 2007; Clarkson, Li, Richardson & Vasvari, 2007), among other variables. For instance, Kim and Lyon (2015) noted that greenwashing practices are more likely to appear in companies that are subject to greater sector regulations (e.g., the electric utility industry), which translates into stronger external pressure. On the other hand, other firms could be motivated to greenwash as a proactive response, when it attempts to create a competitive advantage based on improvements in environmental reputation and corporate image (Lyon & Montgomery, 2015; Marquis et al., 2016). In fact, several authors have suggested that greenwashing practices are common in companies with less dependence on public regulators (Delmas & Montes-Sancho, 2010) and less pressure from environmental activist groups (Marquis et al., 2016). Regardless of whether the greenwasher does so as a reactive or proactive response, we consider that ultimately greenwashers might be interested primarily in building a better corporate image than their real image, intending to satisfy the environmental demands of stakeholders such as clients, suppliers, regulators, and society in general (Lyon & Montgomery, 2015).

3 | HYPOTHESES DEVELOPMENT

3.1 | Effect of perceived greenwashing on managerial decision-making

González Benito and González Benito (2006) considered that three types of environmental management practices exist: organizational and planning practices (which define environmental policies and objectives at the corporate level); operational practices (which imply the inclusion of the specific changes concerning environmental impacts in the productive systems); and communication practices (whose objective is to disclose the firm's environmental commitment to the general society). Greenwashing might be included in the latter category of the environmental management practices.

Furthermore, when the two dimensions specified by Delmas and Burbano (2011) are combined (i.e., environmental performance and green communication), two types of firms emerge related to the environmental communication: firms with a positive environmental performance that communicates this performance to the general public that are recognized as the greenest companies; and firms with poor environmental performance that are recognized as the brown companies (Delmas & Burbano, 2011). According to Kim and Lyon (2015), another type of firm, known as brownwashers, exists. These include firms with positive environmental performance whose communications understates their environmental achievements. Furthermore, we also consider the group called "passivists," that are firms with poor environmental performance and no environmental communications.

TABLE 1 Firm behavior combining environmental performance and green communication

		Environmental performance	
		Poor	***Positive***
Green communications	*Yes*	Greenwashers (Delmas and Burbano 2011)	Greenests
	No	Passivists (Ferrón et al., 2017)	Brownwashers (Kim and Lyon, 2015)

Table 1 summarizes these four types of firm behaviors regarding the positive/poor environmental performance and doing green/not doing green communications.

In relation to these types of firm's behaviors concerning environmental communication, it is essential to highlight that, although it has been assumed that environmental communication practices try to establish relationships with a variety of stakeholders around the company (González Benito and González Benito, 2006), the effect of these practices on managerial decisions has hardly been studied. With regard to the managerial decisions, we consider that, in the presence of perceived greenwashing, managers might doubt the environmental commitment of the greenwashing partner (Seele & Gatti, 2017). This could undermine the contractual relationship between the company and the greenwashing client/supplier. For instance, the scandals at Volkswagen could deteriorate relations with equipment manufacturers who supply its motor and mechanical parts (and who do not belong to the German group). Suppliers may even be willing to break their contracts with Volkswagen if they believe that the group's negative environmental image may harm their own image. Further, this same logic can be applied to other stakeholders, such as environmentalists, community groups, employees, consumers, potential shareholders and investors, public regulators and society as a whole (Skarmeas & Leonidou, 2013). Following this example, managers of the suppliers for Volkswagen could refuse to continue working with the German automotive group for fear that other sector members might stop purchasing their products or to avoid exposure to the spotlight of public regulators, who could take action (such as legal sanctions or penalties) on greenwashing behaviors. The "contagion effect" of being linked to a greenwasher could be interpreted as a negative motivation by managers, because it could harm the related firm's reputation (Skarmeas & Leonidou, 2013; Siano et al., 2017). Consequently, managers attempt to avoid any punishment from stakeholders due to the spread of greenwashing. Considering the decision to trade with greenwashers might harm their firm's reputation and profitability (de Vries et al., 2015), managers will be less likely to enter contractual relationships with greenwashers when greenwashing is publicly known. Following this idea, managers will attempt to encourage and promote business relationships with the greenest firms, because of the positive influence this could have on their reputation and image. Furthermore, relating to this point, we consider that brownwashers are stuck in the middle, since managers are more willing to maintain their business relationships with them than with greenwashers but, at the same time, prefer to be related to the greenest firms instead of to brownwashers. Thus, we hypothesized as follows:

Hypothesis 1a. *Managers are less willing to have business relationships with greenwashers, as compared to the greenest firms, brownwashers, and passivists.*

Hypothesis 1b. *Managers are more willing to have business relationships with the greenest firms, as compared to greenwashers, brownwashers, and passivists.*

Hypothesis 1c. *Managers are more willing to have business relationships with brownwashers, as compared to greenwashers and less willing to have business relationships with brownwashers, as compared to the greenest firms.*

3.2 | Moderating effect of green attitude on the relationship between perceived greenwashing and managerial decision-making

Prior literature highlights the role of personal activism in environmental decision making (e.g., Anderson & Bateman, 2000; Egri & Herman, 2000). Several studies examine the connection of managerial background to the environmental decision-making process, such as the adoption of advanced environmental practices or eco-initiatives (Ramus & Steger, 2000). In fact, managerial attitudes and preferences when implementing environmental advanced practices and green strategies were seminal topics in the initial academic literature on environmental management. This is demonstrated by the publication of several studies on the "green" attitudes and preferences of managers in the special issue of *Academy of Management Journal* (AMJ) in 2000 called "Special Research Forum on the Management of Organizations in the Natural Environment" (e.g., Anderson & Bateman, 2000; Cordano & Frieze, 2000; Egri & Herman, 2000; Flannery & Douglas, 2000; Ramus & Steger, 2000; Sharma, 2000).

According to De la Torre, Aragón-Correa, & Martín-Tapia, (2015:452), "*environmental decisions have three relevant characteristics: a high degree of uncertainty, a strong emotional component and a social acceptance bias toward more pro-environmental positions.*" Thus, we consider that these three circumstances could add an additional degree of complexity to the environmental decision-making process, affecting the factors that determine this process and the role that individuals play in it. For instance, recently, several members of the Business Roundtable called for greater social and environmental responsibility of companies (e.g., Gelles and Yaffe-Bellany, 2019). However, this "call for responsibility" has had both support and

skepticism (The New York Times, 2019). Twenty years after the publication of the special issue in AMJ, this claim is a "novelty" in the business scheme, as most CEOs of multinational companies do not usually publicly proclaim their individual preferences or opinions toward the protection of the environment and other social issues. This public claim could be interpreted as a "statement of intent" by some members of the Business Roundtable, who could decide to transfer (or even have already transferred) their individual attitude toward environmental protection and social issues to the daily operations in their firms.

Regarding the relationship between perceived greenwashing and managerial decision making and based on prior literature about managerial perceptions of environmental issues in management (e.g., Cordano & Frieze, 2000; Sharma, 2000) we consider that this individual attitude toward a greater managerial responsibility concerning environmental issues (we labeled it "green attitude") could influence this link (Cordano & Frieze, 2000). That is, managers with very high levels of green attitude are likely to be more reluctant to a greenwasher approach to a greater extent, than managers with no green attitude (or lower levels), as they understand the need to protect the environment and its translation to management practices in the company. In their decision making, it is likely that they refuse to maintain business relationship with stakeholders such as commercial clients, suppliers, partners or shareholders who are prone (or even accused) to greenwashing. We consider that managers with high levels of green attitude will foster business relationships with the greenest firms and the brownwashers, having more willingness to start or maintain business relationships with these types of firms, especially in comparison with greenwashers. Having a high level of green attitude could be translated by a more qualified manager who detects, understands and interprets the organizations' environmental signals even in the absence of clear green communications. In contrast, managers with low levels of green attitude are less concerned, even less alert, about environmental management in their companies (Cordano & Frieze, 2000), and consequently, the stakeholders having greenwashing behavior goes unnoticed and affects them to a lesser extent in their managerial decision-making. Consequently, we hypothesize that green attitude moderates the effect of perceived greenwashing on managerial decision-making, as follows:

Hypothesis 2. *Managerial green attitude moderates the relationship between the greenwasher, brownwasher or the greenest firm, and managerial decision-making.*

Hypothesis 2a. *Under a high level of green managerial attitude, the willingness to have business relationships with the greenwashers is weakened compared to a low level of green managerial attitude.*

Hypothesis 2b. *Under a high level of green managerial attitude, the willingness to have business relationships with the brownwashers or the greenest firms is strengthened compared to a low level of green managerial attitude.*

4 | METHOD

4.1 | Procedure

We relied on experimental procedure to test our hypotheses. Specifically, we opted for a framed field experiment, which employs nonstandard subject pool (in our case, students as future managers) in a field context in either the commodity, task, or information set that the subjects can use (in our case, managerial perceptions about greenwashing and subsequent decision-making) (Harrison & List, 2004). Owing to the nature of our research hypotheses, the use of framed field experiments is especially appropriate in our work, as they can provide useful insights about managerial behavior (Delmas & Aragón Correa, 2016) and significant and actionable implications for the firm (Chatterji et al., 2016). Additionally, an experimental design is preferred to maximize the power of the tests for the moderation effects (Frazier, Tix, & Barron, 2004).

Proceeding with the experimental design, we use Qualtrics, which is an online software for survey development to run experiments and enable interaction with participants and launching different steps. With this tool, we could control the experiment phases considering the times and guarantee the lack of bias, such as related to researcher-participant interaction. We invited participants to complete the survey hosted online, along with different experimental stimuli. We explained that we would ask participants to examine some information from a firm and answer some questions. Figure 1 shows the three sequential phases that comprised the procedure. First, we gathered data prior to the experimental stimulus, which made it possible to obtain some information from each participant on their opinions and attitudes toward environmental management and corporate and media information.

Second, Qualtrics randomly assigned every participant to one of the four levels of treatment: (2) x Type of media news and (2) x Type of corporate website. Owing to the random assignment, the number of cases in each treatment ranged from 66 to 68 cases per treatment. Finally, it redirected the participants to the survey, where they were asked to respond to the items concerning our dependent variable and the manipulation checks. We established a control to delete observations from participants who took very little time answering the survey (−67% of the average of 127 seconds) or odd little time answering the survey (−46% of the average of 587 seconds). In all, we withdrew 24 invalid observations, because they indicated little attention receiving the stimuli or answering the questionnaire.

4.2 | Participants and sample

The final sample consisted of 243 undergraduate students from four degrees related to business and management studies. The sociodemographic characteristics reflected a typical homogenous distribution of the sample in terms of gender, age, and type of studies as Table 2 shows.

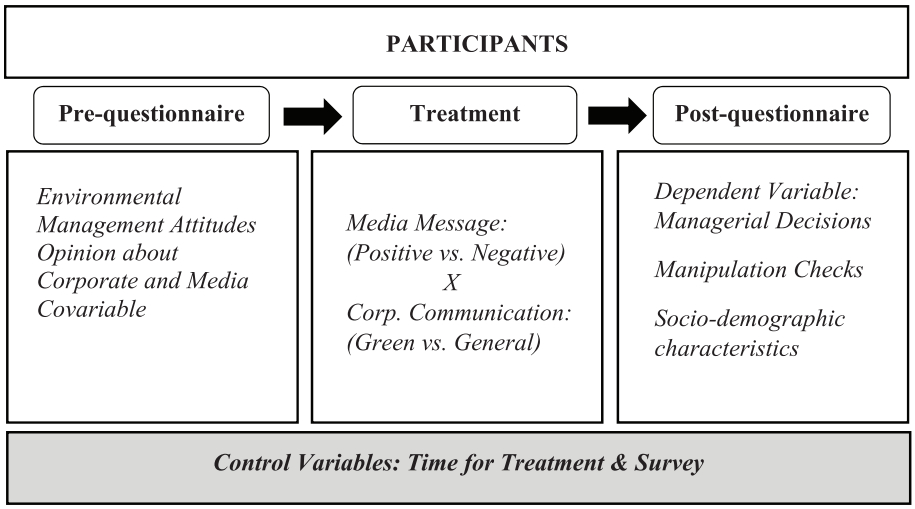

FIGURE 1 Experimental design

TABLE 2 Socio-demographic characteristics

Characteristic	Categories	Sample
Gender	Female	64.6%
	Male	35.4%
Age	17 to 19	51.4%
	20 to 22	41.6%
	Over 22	7.0%
Professional experience	Yes	29.6%
	No	70.4%
Degree	Management and business administration	20.6%
	Accounting and finance	14.8%
	Marketing and market research	15.6%
	Law and management and business administration	49.0%

We use undergraduate students enrolled in management degrees, who serve as potential managers. Although the use of students has been questioned, prior literature considers that using alumni as subjects is adequate for measuring managerial decisions (e.g., Chaudhary, 2019; Christensen & Kohls, 2003; Harrison & List, 2004) and environmental decisions (e.g., De la Torre et al., 2015; Rikhardsson & Holm, 2008; Sciarelli, Tani, Landi & Turriziani, 2020). In fact, numerous studies based on greenwashing have used undergraduate students as subjects (e.g., de Vries et al., 2015; Nyilasy, Gangadharbatla, & Paladino, 2014). This may be because of the lack of cooperation by managers in experimental settings or the high cost of conducting field experiments (Abdelkhalik, 1974; Hughes & Lucas-Gibson, 1991).

Although students are acceptable as valid participants in field experiments, there are some differences in the decision-making of students and managers in the same environment. For instance, Cole and Smith (1996) compared the ethical standards of experienced businesspeople and college senior business students, demonstrating that students have weaker ethical values than do businesspeople. This was in line with the conclusions of Petrof, Sayegh, & Vlahopoulos, (1982), who argued that business faculties might be fostering egocentric rather than society-centric values to their students. Further, Smith, Skalnik, & Skalnik, (1999) conducted a field experiment using students as participants to observe the differences between the decision-making of employed MBA students and those of marketing managers in the work of Fritzche and Becker (1983). Both studies present a variety of ethical dilemmas, where a marketing executive was involved in a personal business venture that conflicts with the company's responsibilities. Smith et al. (1999) confirmed that some differences existed in all the ethical components measured. The results showed that MBA students would act more ethically when the dilemma they face becomes riskier. As a result of prior research that used alumni as subjects in experimental designs, we were aware of the bias when employing students as subjects. Therefore, after conducting our experiment and obtaining the empirical results, we carried out a qualitative cross-validation process involving 10 managers, to assess the external validity of our experimental results (please see section 5.4. Cross-validation check). In addition, we took several other actions during our experiment to alleviate the effect of this bias. First, before beginning the experiment, we asked students to act as company managers. The detailed text is as follows: "*To carry out the following activity, imagine that you have finished your studies and are working in a medium-high management position in a large company, that is, with responsibility to make relevant decisions in the company. Please, assume this role and carefully follow the instructions below.*" Second, we asked participants about their professional experience (29.6% of the sample has previous professional experience). Our aim was to test that there were no differences between the decision-making of students with previous professional experience and the ones with no previous experience. In doing so, we conducted a mean difference test and the results showed that there were no statistically significant differences in terms of their opinion about firm environmental management (t-test = 1.26; p = .21), media and corporate communication (t-test = 1.24; p = .22) and personal green attitude (t-test = 0.28; p = .78). Third, as the experimental context was adapted to be relevant for participants (i.e., they were asked to act as managers), the participants evaluated

TABLE 3 Student ratings on their participation in the experiment

Items	Mean	*SD*
VAL1: The content of the activity has been relevant for my professional development in the business economic world.	4.19	1.48
VAL2: I positively value the content of the activity for my professional development in the business economic world.	4.69	1.50
VAL3: The activity addresses current and important issues for business management.	5.83	1.38
VAL4: Making decisions assuming the role of a company manager has been relevant for my studies.	5.56	1.42

this circumstance as follows. At the end of the experiment, the participants were asked to answer several questions about how they value the experience of being a participant in this experiment in relation to their management studies, from 1 (completely disagree) to 7 (completely agree). Table 3 presents these items.

The results showed that the experiment had high value for the students. For instance, item 3 had the highest score (5.83/7), in which participants showed that the experiment was an important activity for management, followed by item 4, which showed the importance of the experiment for the participant's studies (5.56/7). These high values represent relevant activities for future managers who are specializing for the business world.

Our efforts to mitigate the effects of potential bias in using students in our experiment concluded that management alumni were acceptable as valid participants in experimental design, as we had not detected any abnormal results. Therefore, we consider management students in our experiment as future managers, which present a valid sample for testing our proposed hypotheses.

4.3 | Stimulus development

Following Delmas and Burbano (2011)'s definition about greenwashing, which states that greenwashers combine to have poor environmental performance and make positive communication about it, our manipulated variables that frame the stimulus were corporate communication disclosure and environmental performance. Corporate communication disclosure had two levels: (a) the disclosure of firm mission/vision/values (MVV) with green message versus (b) the disclosure of firm MVV with general corporate message. Firm environmental performance also had two levels: (a) positive environmental performance versus (b) poor environmental performance.

Participants received information about a fictitious chemical company, Nitraldansa, via a screenshot of a corporate website homepage (for manipulating the disclosure of MVV) and a news article about the environmental behavior of the fictitious company (for manipulating environmental performance). We opted to depict a fictitious company to avoid any distortion of the results due to company familiarity or pre-existing company perceptions (de Vries et al., 2015; Nyilasy et al., 2014; Parguel, Benoît-Moreau, & Larceneux, 2011).

To manipulate MVV, we created a fictional screenshot of the interface of Nitraldansa's website to communicate the firm's perspective under a green or a general corporate profile. According to Parguel et al. (2011), the use of a website interface in experimental procedures is recommended primarily because corporate websites are one of the most frequently used and widespread mediums to communicate corporate social responsibility practices. Further, "*online CSR communication influences corporate evaluation after a single exposure, because corporate image generally is malleable compared with corporate reputation and can be modified rapidly through adequate communication*" (Parguel et al., 2011, p. 20). To differentiate the two treatments for MVV in the stimulus website, we used an identical interface of the webpage and very similar text in both, the general corporate MVV and the green MVV (see Appendix A and Appendix B). However, in the green MVV, we incorporated several concepts and keywords related to environmental management issues, such as environmental innovations, eco-efficiency, ecological footprint, and sustainable development. We validated these concepts and words as "environmental" in the database for experiments (e.g., Redondo, Fraga, Padrón & Comesaña, 2007). Appendix A and Appendix B show the differences in the texts of both cases.

To manipulate environmental performance, we used the publication of news about the environmental behavior of the fictitious company, Nitraldansa, in mass media. The two treatments that we attempted to manipulate were positive versus poor environmental performance. In the case of positive environmental performance, we relied on the proposal of Nyilasy et al., (2014), who created news about an award for being the company in the sector that makes the greatest efforts to protect the environment. In the case of poor performance, we created news in which Nitraldansa could not win the environmental award because it had not complied with the required environmental minimums. Appendix C shows the differences in the text of both the positive and the negative news. Similar to Parguel et al. (2011), we created the interface of an article extracted from a fictitious Spanish daily newspaper (see Appendix C).

By combining these four treatments of stimulus (2×2), four experimental groups emerged: (a) "passivists", our control group and the treatment that compiled the general corporate MVV on the website and the negative news; (b) "greenwashers," the treatment that collected the green MVV on the website and the negative news; (c) "brownwashers," the treatment that compiled the general corporate MVV on the website and the positive news; and (d) "greenests," the treatment that brought together the green MVV on the website and the positive news.

4.4 | Measures

Our analyzed variables were "managerial decision" and "green attitude." Further, we also measured "perceived greenwashing" as a manipulation check.

TABLE 4 Used items for managerial decisions and green attitude

Items		$\bar{x}$	SD
Managerial decisions - *The extent you would be willing…*			
MD1	…to become a Nitraldansa supplier.	4.26	1.54
MD2	…to become a Nitraldansa customer/client.	3.90	1.61
MD3	…to collaborate for R&D purposes or to launch a new product with Nitraldansa.	4.62	1.72
MD4	…to acquire shares or to be part of the Nitraldansa ownership structure.	3.80	1.65
MD5	…to acquire Nitraldansa in full.	2.95	1.77
MD6	…to merge with Nitraldansa.	3.34	1.71
MD7	…to be acquired by Nitraldansa.	2.92	1.65
MD8	…to create a joint venture or a temporary union of companies with Nitraldansa.	3.74	1.64
MD9	…to be part of the Nitraldansa management staff.	4.31	1.74
MD10	…to imitate the behavior of Nitraldansa in your own company	3.67	2.00
Green attitude			
GA1	Companies must always reduce their environmental impact even if it can cause damage in terms of profitability.	5.31	1.28
GA2[a]	Companies have a right to damage the environment in order to satisfy their needs whether or not it is justified to improve profits.	1.76	1.15
GA3	The strategy of the company must always guarantee the protection of the environment as a basic principle from which other possibilities can be raised.	5.75	1.39
GA4	The decision-making process concerning environmental matters is related to business management and its study and analysis should be included in the business and economics graduate programs.	5.80	1.38

Source: Adapted from De la Torre et al. (2015) & Chatterji et al. (2016).
[a]We include this item by reversing the wording to get a stronger and more valid measure of the green attitude (Weijters & Baumgartner, 2012).

To measure "managerial decision," we relied on adapted items from the validated scales of De la Torre et al., (2015) and Chatterji et al. (2016), which were multiple-item scales that question subjects about the extent they would be willing to accept several business decisions (with their level of information about Nitraldansa). Table 4 shows the items used. Subjects could answer the proposed items using the seven-point responses from 1 = "nothing willing" to 7 = "fully willing."

We also measured the participants' general attitude toward the importance of environmental management by relying on prior literature (e.g., De la Torre et al., 2015). For this issue, the questionnaire included four items to measure this green attitude by asking participants about their level of agreement or disagreement (i.e., from 1 = "total disagreement" to 7 = "full agreement") concerning the items that are shown in Table 4. Note that the subjects were asked these statements before they were exposed to the treatment, as recommended by prior literature (e.g., Castañeda-García, Frías-Jamilena, Rodríguez-Molina, & Jones, 2019).

We conducted reliability and dimensionality analyses to confirm the validity of these scales (Churchill, 1979; Anderson & Gerbing, 1988). For reliability, we determined Cronbach's alpha (Cronbach, 1970). The item-total correlations for each element of the scales (Bagozzi, 1994) were greater than 0.34 (Nurosis, 1993), in support of internal consistency. In a confirmatory factor analysis (CFA), we evaluated the scales' dimensionality (Hair, Anderson, Tatham, & Black, 1998), which enabled us to calculate the average of the indicators that constitute the construct. In that case, we could use a single variable to represent the theoretical constructs (Anderson and Gerbing, 1988). Further, we required factorial loading (λ) to be greater than 0.6, with a significant total explained variance (Hair et al., 1998). The relevant analyses supported the proposed scales. Consequently, Cronbach's alpha test shows acceptable reliability indices for the managerial decision scale (α = .93) and for the green attitude scale (α = .73) (Nunnally, 1978) and we could extract only one factor from managerial decision (λ > 0.62; AVE = 0.56; CR = 0.92) and another factor from green attitude (λ > 0.70; AVE = 0.56; CR = 0.83).

In addition to these main variables, our questionnaire also included several control variables as well as selection and manipulation check measures. We controlled for several socio-demographic and professional conditions of the subject, such as age, gender, professional experience (number of months), if the subject has worked at companies in highly polluting sectors, the sector in which the current firm of the subject operates, and whether the current firm of the subject is environmentally certified. We also accounted for several subject perceptions and opinions that could affect the responses.

4.5 | Pre-tests

Before launching the experiment for the planned subject pools, we conducted two types of pre-tests to analyze the degree of adequacy of both the stimulus and the items presented in the questionnaire after exposure to the stimulus. The first of these two pre-tests was related to experimental stimuli. Similar to Nyilasy et al., (2014), we conducted a quantitative pre-test using a sample of 45 undergraduate students. The two website screenshots (with green MVV and with general corporate MVV) were shown on a classroom screen and students were asked to rate their agreement or disagreement (using a seven-point scale) with the following two statements after exposure to each website screenshot: "*The information and content of the website suggest that the company is an innovative company*" and "*The information and content of the website suggest that the company is an environmentally friendly company*." We ran descriptive statistics to compare means. As expected, for the green MVV screenshot, subjects rated the company as environmentally friendly (Mean = 5.33; SD =1.26; $p < .00$), and for the general corporate MVV screenshot, subjects rated the company as innovative (Mean = 4.79; *SD* = 1.63; $p < .00$). Using the same procedure, the two news articles (i.e., news in which Nitraldansa won the environmental award and news in which it did not win the environmental award) were shown on the classroom screen. Students were asked to rate their agreement or disagreement using a scale from 1 (completely disagree) to 7 (completely agree) with the following two statements after exposure of each news screenshot: "*The information and content of the news suggest that the company has positive environmental performance*" and "*The information and content of the news suggest that the company has poor environmental performance*." As expected, with regard to the positive news, subjects rated the company as having positive environmental performance (Mean = 5.90; *SD* = 1.25; $p < .00$), and for the negative news, subjects rated the company as having poor environmental performance (Mean = 4.05; *SD* = 1.95; $p < .00$). These results suggest that the manipulation of the stimulus significantly differed between the green/general corporate MVV and from the positive/poor environmental performance, showing that the treatments clearly collected the intended green versus no green messages and they were perceived as realistic (Nyilasy et al., 2014).

Additionally, to test the adequacy of the items presented in the questionnaire after exposure to the stimulus, six faculty members who had experience with experimental design in the social sciences provided qualitative feedback. In the case of stimulus, the texts of both MVV on the websites and in the news were modified to present more homogenous wording between the green and no green treatment. In addition, the experts recommended changing the order presentation of the manipulation check and control items, moving some items from the end of the questionnaire to the beginning to avoid the halo effect. Nonetheless, additional checks were made on the adequacy of the manipulation of the experiment (please, see next section).

5 | RESULTS

Before testing our hypotheses, we undertook some analyses on the data to rule out the existence of common biases in experimental design, such as is sample selection and manipulation in the stimuli.

5.1 | Sample selection bias

We assigned all the participants to one of the four experimental groups. We ensure this circumstance using the random assignation of Qualtrics (please see the Procedure section). Additionally, to ensure well-balanced distribution of the participants across the four groups, we calculated the association between each assigned group and four socio-demographic characteristics (Castañeda-García et al., 2019). The results of Table 5 show that the distribution of cases in terms of gender, age, professional experience (yes/no) and type of degree to which the participant belongs was across the four groups.

We also checked whether the combination of two stimuli (i.e., webpage screenshot and the news) with two versions of each could be misinterpreted, as some people may have a negative (or positive) predisposition toward online information (either online news or corporate websites). To account for this bias, the questionnaire included two scales to measure the attitudes toward the credibility of online messages, according to Parguel et al. (2011). These items question participants on their degree of agreement or disagreement with the following statements: "*The information and content published by the newspapers seem totally credible to me*" and "*The information and content published by the corporate websites seem totally credible to me*." Subjects could choose from 1 (completely disagree) to 7 (completely agree). Note that we showed these two items before exposing the subjects to the stimuli. We ran two analyses of variances (ANOVAs) using these two items as dependent variables, and

TABLE 5 Test for association between the experimental groups and the socio-demographic variables

Socio-demographic variable	Chi-square (df)	*p*-value
Gender	1.40 (3)	.70
Age	3.54 (6)	.74
Professional experience	4.88 (3)	.18
Degree	3.21 (12)	.99

"assigned news" and "assigned website screenshot" as the independent variables, respectively. The results demonstrated that there was neither relationship between the attitudes toward the credibility of online messages in newspapers and the treatment "assigned news" (F = 2.63; p = .11), nor between the attitudes toward the credibility of corporate websites and the treatment "assigned website screenshot" (F = 0.67; p = .41). These findings led us to conclude that the attitudes toward online information did not influence the manipulation of independent variables.

5.2 | Manipulation checks

Although the pre-test could help ensure that the stimuli were operating correctly, running additional checks using the final sample is recommended (Castañeda-García et al., 2019). We then performed two manipulation checks to prove the consistency of the stimuli. First, we checked whether the group assigned as greenwasher (i.e., green MVV and negative news) is associated with the previous scale measuring perceived corporate greenwashing. In doing so, we used the multiple-item scale, seven-point version (from 1-completely disagree to 7-completely agree) adapted from items offered by Leonidou and Skarmeas (2017). Table 6 presents these items. Cronbach's alpha test shows acceptable reliability indices for the perceived greenwashing scale (α = .86) (Nunnally, 1978) and we could extract only one factor from perceived greenwashing (λ > 0.70; AVE = 0.61; CR = 0.86). Further, we ran ANOVA in which the dependent variable was "perceived corporate greenwashing" and the factor that was the treatment group. As expected, the results of this ANOVA showed that the mean of the group "greenwashers" is the highest ($Mean_{greenwashers}$ = 5.36 vs. $Mean_{non\text{-}greenwashers}$ = 4.33; F = 27.37; p < .00). Consequently, the score of perceived greenwashing by subjects was the greatest in the case of the treatment "green MVV and negative news," which demonstrated that validated items in prior literature were correctly assigned with the greenwasher group.

Second, we used two items that questioned participants—after exposure to the stimuli—about their degree of agreement or disagreement with the following statements: "*The mission, vision, and values of Nitraldansa, visible on its website, clearly focus on transmitting its total commitment to the environment*" and "*Nitraldansa's website contains content on the environmental aspects of the company*." Participants could respond from 1 (completely disagree) to 7 (completely agree). We ran a MANOVA considering these two items as dependent variables and the factor that was the assigned corporate website screenshot (green MVV or general MVV). The results showed that participants assigned to the "green MVV" group presented higher average scores for both items than those assigned to the "general MVV" group (see Table 7). Similarly, we used two items to check the consistency of the message in the news. These items questioned participants—after exposure to the stimuli— about their degree of agreement or disagreement with the following statements: "*Nitraldansa has good environmental performance*" and "*Nitraldansa is a clear example for the other companies in the sector on treating the environmental aspects in a company to guarantee low environmental impact*." Participants could respond from 1 (completely disagree) to 7 (completely agree). We also ran a MANOVA considering these two items as dependent variables and the factor that was the assigned news (positive or negative). The results showed that subjects assigned to the "positive news" group presented higher average scores for both items than those assigned to the "negative news" group. Table 7 shows the findings of these check analyses. Obtained results confirmed those obtained from the pre-test.

5.3 | Testing the hypotheses

To test our hypotheses, for Hypotheses 1 (i.e., 1a, 1b and 1c), we ran an ANOVA and a Bonferroni post hoc test for comparisons among the treatment groups. Meanwhile, for Hypotheses 2 (i.e., 2a and 2b) we run a hierarchical multiple regression to examine the moderator effects because the moderator variable is measured as a continuous scale (Aguinis, 1995; Frazier et al., 2004). To test Hypotheses 1, which states that different levels of willingness exist to ensure business relationships are dependent on the different environmental communication behaviors, we ran an ANOVA in which the dependent variable is "managerial decisions" and the factors are the four treatment groups (i.e., greenwashers, brownwashers, greenests, and passivists). As predicted, the greenwasher group had the lower mean in the managerial

TABLE 6 Used items of perceived corporate greenwashing

Items		$\bar{x}$	*SD*
GW1	**Nitrandalsa presents a confusing message (using certain words and images) about its environmental behavior.**	**4.33**	**1.65**
GW2	Nitrandalsa provides vague or seemingly unprovable environmental claims about its environmental performance.	4.56	1.60
GW3	Nitrandalsa overstates or exaggerates its environmental behavior.	4.67	1.66
GW4	Nitrandalsa omits or hides important information about its real environmental behavior.	4.79	1.71

Source: Adapted from Leonidou and Skarmeas (2017).

TABLE 7 Manipulation checks of individual stimulus

Check	Green MVV (mean)	Corporate MVV (mean)	F	*p*-value
The mission, vision and values of Nitraldansa, visible on its website, clearly focus on transmitting its total commitment to the environment	5.52	4.24	36.15	.00
Nitraldansa's website has content on environmental aspects of the company	4.92	3.90	22.86	.00
Check	**Negative news (mean)**	**Positive news (mean)**	**F**	***p*-value**
Nitraldansa is a clear example for the rest of the companies in the sector on how the environmental aspects in a company should be treated to guarantee low environmental impact	3.35	5.30	113.70	.00
Nitraldansa has good environmental performance	3.14	5.32	111.36	.00

TABLE 8 Bonferroni test of post hoc comparisons

					Confidence interval 95%	
(I) Treatment group	(J) Treatment group	Mean difference (I-J)	*SE*	Sig.	Lower bound	Upper bound
Passivists	Brownwashers	−0.89	0.22	0.000	−1.47	−0.30
	Greenwashers	0.22	0.22	1.000	−0.36	0.81
	Greenests	−1.04	0.22	0.000	−1.63	−0.45
Brownwashers	Passivists	0.89	0.22	0.000	0.30	1.47
	Greenwashers	1.11	0.22	0.000	0.52	1.70
	Greenests	−0.15	0.22	1.000	−0.74	0.44
Greenwashers	Passivists	−0.22	0.22	1.000	−0.81	0.36
	Brownwashers	−1.11	0.22	0.000	−1.70	−0.52
	Greenests	−1.26	0.22	0.000	−1.85	−0.66
Greenests	Passivists	1.04	0.22	0.000	0.45	1.63
	Brownwashers	0.15	0.22	1.000	−0.44	0.74
	Greenwashers	1.26	0.22	0.000	0.66	1.85

decision variable followed by the passivists, the brownwashers and the greenests, respectively ($Mean_{greenwashers}$ = 3.11 vs. $Mean_{passivists}$ = 3.34 vs. $Mean_{brownwashers}$ = 4.22 vs. $Mean_{greenests}$ = 4.37; F = 16.09; p < .00). To examine the significance of these differences, we ran a Bonferroni post hoc test, which suggested the best combination (Park, Lennon, & Stoel, 2005). The results of Table 8 show that Hypotheses 1a, 1b, and 1c cannot be rejected, confirming that: (a) the greenwashing group generates the lowest willingness to have business relationships; (b) the greenest group generates the highest willingness to have business relationships and; (c) brownwashing is better than greenwashing but worse than the greenest option in terms of generating willingness to have business relationships.

To test Hypothesis 2, which states that managerial green attitude moderates the effect of the different environmental communication behaviors on managerial decision-making, we ran a hierarchical multiple regression. In this regression model, we developed two steps. In step 1, the dependent variable was "managerial decisions", and the independent variables were three dichotomous variables for the treatment groups greenwasher, brownwasher, and greenest, respectively (where 1 means "yes", and 0 means "no"), and the variable green attitude. In step 2, three multiplicative terms were included to capture the moderation effects between each treatment group and the green attitude. Table 9 shows the results of these estimations. As expected, there is a statistically significant negative interaction effect between the greenwasher group and the green attitude (β = −1.45, B 95% CI = [−1.16, −0.36]; p = .00). Meanwhile there are two statistically significant positive interaction effects: one effect is between the brownwasher group and the green attitude (β = 1.35, B 95% CI = [0.35, 1.07]; p = .00), and the other positive effect is between the greenest group and the green attitude (β = .87, B 95% CI = [0.06, 0.86]; p = .02).

The direction of these moderating effects is depicted in Figure 2. When there is a high tendency toward environmental management (i.e., green attitude), there is less willingness to having business relationships with the greenwashers than in cases with low levels of the green attitude. In other words, managers with a higher green attitude penalize more greenwashing behaviors than managers with a lower green attitude. Conversely, under a high green attitude scenario, there

TABLE 9 Testing moderation effects using hierarchical multiple regression

	B	*SE B*	*95% CI*	*β*	R^2
Step 1					
Greenwasher group (GW)	−0.22	−0.07	−0.65,0.20	−.07	
Brownwasher group (BR)	0.87**	0.22	0.44,1.30	.29**	
Greenest group (GR)	1.02**	0.33	0.59,1.46	.33**	
Green attitude (GA)	0.25	0.09	−0.05,0.56	.09	0.16**
Step 2					
GW X GA	−0.76**	0.20	−1.16,-0.36	−1.45**	
BR X GA	0.71**	0.18	0.35,1.07	1.35**	
GR X GA	0.46*	0.20	0.06,0.86	0.87*	0.17**

*$p < .05$.
**$p < .00$.

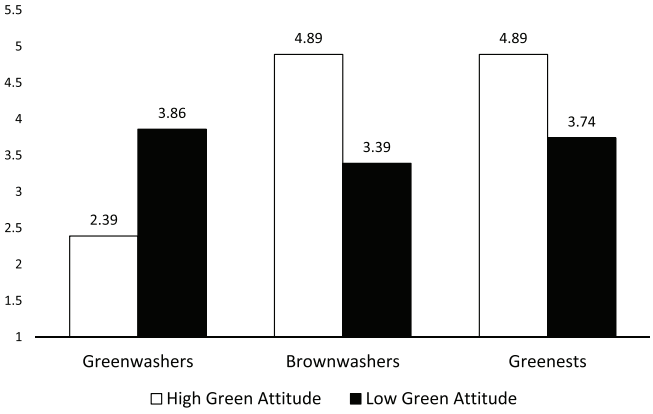

FIGURE 2 Effect of treatment groups and green attitude on managerial decision

is more willingness to having business relationships with the brownwashers and the greenest groups in comparison with the low levels of green attitude. Expressly, managers with a higher green attitude are more interested in business relationships with the brownwashers or the greenest firms than managers with a lower green attitude. In view of these findings we cannot reject Hypotheses 2a and 2b, respectively.

5.4 | Cross-validation check

We carried out 10 semi-structured interviews (47 minutes of duration on average) with seven top executive managers (four from SME[1]s and three from large companies) and three area managers (one from an SME and two from large companies). First, we asked the experts if they thought we presented our stimuli effectively and executed the procedure appropriately. All of them agreed with our research experimental approach. We then questioned them about our findings on the two hypotheses. Again, all of them agreed with our empirical results when discussing the negative effect of perceived greenwashing on the willingness to have business relationships, that is, with the results obtained regarding Hypothesis 1. All of them alluded to the importance of trust in the business world. Further, in relation to Hypothesis 2, all managers claimed that in the presence of high environmental protection attitude, they would want to have business relationships with other companies with the same vision toward the natural environment, avoiding greenwasher behavior. However, managers who work in large companies stated that if a potential client or supplier is carrying out greenwashing practices, the economic element usually weighted more in making a decision than the environmental one, although these practices undoubtedly affect business relationships. Finally, we asked managers for their opinion on the level of reality, usefulness, and applicability of the experimental results obtained. They answered that the results obtained are very reasonable, and their managerial implications could be helpful for managers. From these cross-validation outcomes, we can conclude that our experimental results offer a realistic and consistent vision about the perceived greenwashing effect on the managerial decision-making process.

6 | CONCLUSIONS AND DISCUSSION

This study used an experimental design to empirically demonstrate that managerial decisions could be influenced by greenwashing and how this relationship could be moderated by the managers' attitude toward environmental management.

Our findings contribute significantly, from a methodological perspective, to existing research on greenwashing. According to Chatterji et al. (2016:117-118), the main advantages of using field experiments in management research are (a) to create exogenous variation to identify causal relationships clearly, instead of being constrained by existing data; (b) to assess specific processes and activities inside firms, where traditional data sources are unable to provide sufficient detail; and (c) to obtain more confidence regarding any difference between the treatment and control means due to the intervention. This study gave us the opportunity to confirm these three main advantages of experimental design in at least two ways. On the one hand, based on the prior

literature, we created a stimulus to simultaneously manipulate both green/general corporate messages on a firm's website and the positive/poor environmental performance of the firm. These two manipulated variables corresponded with the seminal definition of Delmas and Burbano (2011:65), who suggested that greenwashing is "the intersection of two firm behaviours: poor environmental performance and positive communication about environmental performance." By manipulating these two variables, which are the origin of greenwashing, it is easier to identify causal relationships related to greenwashing. It is now essential to note that consequently our results have contributed to develop an empirical measure of the concept of greenwashing through experimental design. On the other hand, using our experimental procedure, we isolate the effect of perceived greenwashing on managerial decisions, as this methodological approach is one of the best ways to assess managerial behaviors that are not possible to analyze using traditional data sources, as stated by Chatterji et al. (2016). Specifically, our results present empirical evidence about the effect of greenwashing on managerial decisions, demonstrating that when perceived greenwashing increases, the managerial willingness of collaborating with the greenwasher decreases.

Furthermore, from a theoretical perspective, our findings contribute to existing research in at least four ways. First, Aguinis and Glavas (2012), in their theoretical review of the CSR issues, noted the need for more research at an individual level, recommending the study of the bidirectional relationship between the aspects at the organizational or institutional level and the individual level. Consistent with this recommendation, we consider that the perception of greenwashing as well as an individual's green attitude are two of the multiple underlying mechanisms that contribute to explaining the micro-foundations on the CSR concerning how individual variables affect organizational variables. Specifically, our work attempts to examine how greenwashing affects managerial decision-making (individual behavior) and how green attitude (managerial values) affects managerial decision-making in the presence of greenwashing (firm strategic priorities), making a theoretical contribution to the literature on the CSR. Second, from the stakeholders'' engagement perspective, our findings are also interesting, as firms have to integrate the preferences and needs of their stakeholders in their strategy (Ferrón-Vílchez, Darnall, & Aragón-Correa, 2017), to add value to the firm and obtain a competitive advantage. In this respect, our results suggest that greenwashing could influence the managerial decisions of several stakeholders such as suppliers, clients, or investors, among others. This result is in agreement with prior studies that concluded greenwashing could be understood as a firm's response to the stakeholders' preferences with the objective of building a better corporate image than their real image (Lyon & Montgomery, 2015), but it only works in the short-term, that is, until the real intention is discovered. At that point, managers who perceive greenwashing start to form negative feelings about the greenwasher, which also negatively affects their willingness to start or continue the business relationship with the greenwasher. Third, Siano et al. (2017) considered that it is necessary to make a greater number of empirical contributions whose results review the traditional approach to the CSR communication practices, thus excavating the usefulness of greenwashing practices. Our empirical results shed light on this fact, demonstrating that a manager's perception that one of the stakeholders is a greenwasher, can significantly affect managerial decisions on whether to establish (or not) a business relationship with that stakeholder. Furthermore, these results are also especially interesting as a theoretical contribution to the literature on greenwashing since, although prior studies have analyzed the perceived greenwashing under the lens of the decision-making of consumers (e.g., de Vries et al., 2015; Nyilasy et al., 2014; Szabo & Webster, 2020), they had not focused on the decision-making of managers. Finally, our results also show that the relationship between perceived greenwashing and the willingness to have business relationships is moderated by a high level of managerial green attitude. This could be explained by the fact that the managerial knowledge and feelings are intrinsic to the decision-making of the firm, and there would be high correlation between both. Literature explaining the effect of managers' perception on the strategic decision-making of the firm is plenteous (Cordano & Frieze, 2000; Sharma, 2000). In this respect, prior research argues that the attitudes and preferences of individual managers influence the decision-making related to environmental management, motivating the adoption of green practices in the firm (Cordano & Frieze, 2000; Sharma, 2000). In addition, Banerjee (2001) indicated that environmental issues are integrated at higher levels of strategy when managerial awareness is high. Consequently, our results corroborate the arguments of prior literature about green managerial attitudes and preferences by showing that high managerial green attitude has a negative moderating effect on the relationship between perceived greenwashing and the willingness to have business relationships. In other words, when the level of managerial green attitude is high, there is less willingness to have business relationship when perceived greenwashing exists. This is in line with Wassmer, Paquin, and Sharma (2012), who stated that some firms' collaborations might have potentially negative consequences when they are managed poorly, and they may even destroy firm value. Owing to the potential risk of losing firm value, the strategic response of firms with an environmental managerial attitude is to decline potential collaborations with greenwashers. As hypothesized, managers with high levels of green attitude are likely to be more critical of greenwashing behaviors. Overall, we can conclude that greenwashing is a short-term strategy that consists of poor environmental performance and high environmental disclosure. This may behave in the expected way for a short period of time, until stakeholders understand the real situation of the greenwasher. This results in a drastic drop in the image and reputation of the greenwasher, requiring a long time to recover.

6.1 | Future lines

This study is bounded by our experimental design, and therefore, our results are not exempt from several limitations. Prospective research would benefit from studying the proposed relationship using managers as participants directly and discerning whether significant differences could exist between "managers' perceptions" and "potential managers' perceptions" about greenwashing. Further, we considered the moderating effect of "green attitude" in the relationship between perceived

greenwashing and managerial decisions. Future studies could use other moderators that could influence this relationship, such as managerial green skepticism (Leonidou & Skarmeas, 2017) or belonging to a "green" team (De la Torre et al., 2015). Finally, despite the advantages of testing the proposed relationships using an experimental design (e.g., Chatterji et al., 2016; Delmas & Aragón Correa, 2016), it would also be especially interesting to be able to corroborate whether our findings were similar to those obtained through a managerial survey.

6.2 | Managerial implications

Now, it is interesting to respond to the question in the introduction: is it possible that the behavior of a greenwasher does not affect its corporate image, and therefore, its relations with external agents? Our results show that managers tend to be less willing to have business relationships with greenwashers. How is it possible that Volkswagen Group was the largest automaker worldwide in recent years, despite greenwashing? This work has isolated the greenwashing effect on managerial decision-making. However, other organizational variables could be influencing the Volkswagen Group's relationships with its stakeholders, such as long-term contractual relations with suppliers, internal agreements with investors, and so on. Unfortunately, these variables are not the focus of this study.

By manipulating both green/general corporate messages on a firm's website and the positive/poor environmental performance of the firm, it is possible to obtain more confidence about the effect of greenwashing on managerial decisions. We suggest that this isolated analysis is not only essential for advances and contributions (theoretical and empirical) in the study of environmental management but also for offering important implications for practitioners. For instance, it is particularly interesting to understand how other managers might react when they discover greenwashing behavior in their clients, suppliers, or commercial partners; would they be willing to break a contractual relationship or would they be unaffected by accusations of greenwashing from their business partners? Further, we consider that the potential results of our proposal could be extrapolated to similar research contexts that attempt to move forward not only in greenwashing-related behavior but also in other management practices related to organizational sustainable development (Zollo, Cennamo, & Neumann, 2013).

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ENDNOTE

[1] Small and medium entreprises.

REFERENCES

Abdel-khalik, A. R. (1974). On the efficiency of subject surrogation in accounting research. *The Accounting Review*, *49*, 743–750.

Aguinis, H. (1995). Statistical power problems with moderated multiple regression in management research. *Journal of Management Research*, *21*, 1141–1158.

Aguinis, H., & Glavas, A. (2012). What we know and don't know about corporate social responsibility: A review and research agenda. *Journal of Management*, *38*, 932–968.

Albertini, E. (2014). A descriptive analysis of environmental disclosure: A longitudinal study of French companies. *Journal of Business Ethics*, *121* (2), 233–254.

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modelling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*, 411–423.

Anderson, L. M., & Bateman, T. S. (2000). Individual environmental initiative: Championing natural environmental issues in U.S. business organizations. *Academy of Management Journal*, *43*, 548–570.

Bagozzi, R. P. (1994). Structural equation model in marketing research: Basic principles. In R. P. Bagozzi (Ed.), *Principles of marketing research* (pp. 317–385). Oxford, UK: Blackwell.

Banerjee, S. B. (2001). Corporate environmental strategies and actions. *Management Decision*, *39*, 36–44.

Bowen, F. (2014). *After greenwashing: Symbolic corporate environmentalism and society*. Cambridge, England: Cambridge University Press.

Castañeda, J. A., Frías-Jamilena, D. M., Rodríguez-Molina, M. A., et al. (2019). Online marketing effectiveness-the influence of information load and digital literacy, a cross-country comparison. *Electronic Markets*, https://doi.org/10.1007/s12525-019-00372-9.

Chatterji, A., Findley, M., Jensen, N. M., Meier, S., & Nielson, D. (2016). Field experiments in strategy research. *Strategic Management Journal*, *37*, 116–132.

Chaudhary, R. (2019). Green human resource management and job pursuit intention: Examining the underlying processes. *Corporate Social Responsibility and Environmental Management*, *26*(4), 929–937.

Chiu, T. K., & Wang, Y. H. (2015). Determinants of social disclosure quality in Taiwan: An application of stakeholder theory. *Journal of Business Ethics*, *129*(2), 379–398.

Cho, C. H., & Patten, D. M. (2007). The role of environmental disclosures as tools of legitimacy: A research note. *Accounting, Organizations and Society*, *32*, 639–647.

Cho, C. H., & Roberts, R. W. (2010). Environmental reporting on the internet by America's toxic 100: Legitimacy and self-presentation. *International Journal of Accounting Information Systems*, *11*, 1–16.

Christensen, S. L., & Kohls, J. (2003). Ethical decision making in times of organizational crisis. *Business and Society*, *42*, 328–358. https://doi.org/10.1177/000765030325585

Churchill, G. A. (1979). A paradigm for developing better measures for marketing constructs. *Journal of Marketing Research*, *16*, 64–73.

Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P. (2007). Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis. *Accounting, Organizations and Society*, *33*, 303–327.

Cole, B. C., & Smith, D. L. (1996). Perception of business ethics: Students vs. business people. *Journal of Business Ethics*, *15*, 889–896.

Cordano, M., & Frieze, I. H. (2000). Pollution reduction preferences of U.S. environmental managers: Applying Ajzen's theory of planned behavior. *Academy of Management Journal*, *43*, 627–641.

Cronbach, L. J. (1970). *Essentials of psychological testing*. New York, NY: Harper and Row.

D'Amico, E., Coluccia, D., Fontana, S., & Solimene, S. (2016). Factors influencing corporate environmental disclosure. *Business Strategy and the Environment*, *25*(3), 178–192.

De la Torre Ruiz, J. M., Aragón Correa, J. A., & Martín Tapia, I. (2015). Do individual preferences affect the environmental decision-making process in teams? The role of participation. *Business, Strategy and the Environment*, *24*, 451–465.

de Vries, G., Terwel, B. W., Ellemers, N., & Daamen, D. D. (2015). Sustainability or profitability? How communicated motives for environmental policy affect public perceptions of corporate greenwashing. *Corporate Social Responsibility and Environmental Management*, *22*, 142–154.

Delmas, M. A., & Aragon-Correa, J. A. (2016). Field experiments in corporate sustainability research: Testing strategies for behavior change in markets and organizations. *Organization & Environment*, *29*, 391–400.

Delmas, M. A., & Burbano, V. C. (2011). The drivers of greenwashing. *California Management Review*, *54*(1), 64–87.

Delmas, M. A., & Montes Sancho, M. J. (2010). Voluntary agreements to improve environmental quality: Symbolic and substantive cooperation. *Strategic Management Journal*, *31*, 575–601.

Egri, C. P., & Herman, S. (2000). Leadership in the north American environmental sector: Values, leadership styles, and contexts of environmental leaders and their organizations. *Academy of Management Journal*, *43*, 571–604.

Ewing, J. (2018, January 25). 10 monkeys and a beetle: Inside VW's campaign for 'clean diesel'. *The* New York Times. Retrieved from https://www.nytimes.com/2018/01/25/world/europe/volkswagen-diesel-emissions-monkeys.html?action=click&contentCollection=Business%20Day&module=RelatedCoverage&region=Marginalia&pgtype=article

Ferrón Vílchez, V., Darnall, N., & Aragón Correa, J. A. (2017). Stakeholder influences on the design of firms' environmental practices. *Journal of Cleaner Production*, *142*, 3370–3381.

Flannery, B. L., & Douglas, M. R. (2000). Environmental ethical decision making in the U.S. metal-finishing industry. *Academy of Management Journal*, *43*, 642–662.

Frazier, P. A., Tix, A. P., & Barron, K. E. (2004). Testing moderator and mediator effects. Counseling psychology research. *Journal of Counseling Psychology*, *51*(1), 115–134.

Fritzche, D. J., & Becker, H. (1983). Ethical behavior of marketing managers. *Journal of Business Ethics*, *2*, 291–299.

Furlow, N. E. (2010). Greenwashing in the new millennium. *The Journal of Applied Business and Economics*, *10*(6), 22.

Garcés-Ayerbe, C., Rivera-Torres, P., & Suárez-Perales, I. (2019). Stakeholder engagement mechanisms and their contribution to eco-innovation: Differentiated effects of communication and cooperation. *Corporate Social Responsibility and Environmental Management*, *26*(6), 1321–1332.

Gelles, D., & Yaffe-Bellany, D. (2019, August 19). Shareholder value is no longer everything, top C. *E.O.s Say. The New York Times.* Retrieved from. https://www.nytimes.com/2019/08/19/business/business-roundtable-ceos-corporations.html

Guo, R., Tao, L., Li, C. B., & Wang, T. (2017). A path analysis of greenwashing in a trust crisis among Chinese energy companies: The role of brand legitimacy and brand loyalty. *Journal of Business Ethics*, *140*, 1–14.

Hair, J. F. J. R., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis*. Englewood Cliffs, NJ: Prentice-Hall.

Harrison, G. W., & List, J. A. (2004). Field experiments. *Journal of Economic Literature*, *42*, 1009–1055.

Heras-Saizarbitoria, I., Borial, O., & Díaz de Junguitu, A. (2020). Environmental management certification and environmental performance: Greening or greenwashing? *Business, Strategy and the Environment*, *29*, 2829–2841.

Huang, C. L., & Kung, F. H. (2010). Drivers of environmental disclosure and stakeholder expectation: Evidence from Taiwan. *Journal of Business Ethics*, *96*(3), 435–451.

Hughes, C. T., & Lucas-Gibson, M. (1991). Students as surrogates for managers in a decision-making environment: An experimental study. *Journal of Management Information Systems*, *8*, 153–166.

Kim, E. H., & Lyon, T. P. (2015). Greenwash versus brownwash: Exaggeration and undue modesty in corporate sustainability disclosure. *Organization Science*, *26*, 705–723.

Leonidou, C. N., & Skarmeas, D. (2017). Gray shades of green: Causes and consequences of green scepticism. *Journal of Business Ethics*, *144*, 104–415.

Lyon, T. P., & Maxwell, J. W. (2011). Greenwash: Corporate environmental disclosure under threat of audit. *Journal of Economics & Management Strategy*, *20*(1), 3–41.

Lyon, T. P., & Montgomery, A. W. (2013). Tweetjacked: The impact of social media on corporate. *Journal of Business Ethics*, *118*, 747–757.

Lyon, T. P., & Montgomery, A. W. (2015). The means and end of greenwash. *Organization & Environment*, *28*, 223–249.

Mahoney, L. S., Thorne, L., Cecil, L., & LaGore, W. (2013). A research note on standalone corporate social responsibility reports: Signaling or greenwashing? *Critical Perspectives on Accounting*, *24*, 350–359.

Marquis, C., Toffel, M. W., & Zhou, Y. (2016). Scrutiny, norms, and selective disclosure: A global study of greenwashing. *Organization Science*, *27*, 483–502.

Mitchell, L. D., & Ramey, W. D. (2011). Look how green I am! An individual-level explanation for greenwashing. *Journal of Applied Business and Economics*, *12*(6), 40–46.

Mühlauer, A. B., Dodt, S., Hägler, M., & Ott, K. (2018, January). *30.* Süddeutsche Zeitung Retrieved from:: VWs Cheflobbyist wird ruhiggestellt. http://www.sueddeutsche.de/wirtschaft/volkswagen-vws-cheflobbyist-wird-ruhiggestellt-1.3846734

Murillo-Luna, J. L., Garcés-Ayerbe, C., & Rivera-Torres, P. (2008). Why do patterns of environmental response differ? A stakeholders' pressure approach. *Strategic Management Journal*, *29*(11), 1225–1240.

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York, NY: McGraw-Hill.

Nurosis, M. J. (1993). SPSS for windows base system users guide. Release 6.0. Englewood Cliffs, NJ.

Nyilasy, G., Gangadharbatla, H., & Paladino, A. (2014). Perceived greenwashing: The interactive effects of green advertising and corporate environmental performance on consumer reactions. *Journal of Business Ethics*, *125*, 693–707.

Parguel, B., Benoît-Moreau, F., & Larceneux, F. (2011). How sustainability ratings might deter 'greenwashing': A closer look at ethical corporate communication. *Journal of Business Ethics*, *102*, 15–28.

Park, J., Lennon, S. J., & Stoel, L. (2005). On-line product presentation: Effects on mood, perceived risk, and purchase intention. *Psychology & Marketing*, *22*(9), 695–719.

Petrof, J. V., Sayegh, E. E., & Vlahopoulos, P. I. (1982). The influence of the school of business on the values of its students. *Journal of the Academy of Marketing Science*, *10*, 500–513.

Ramus, C. A., & Montiel, I. (2005). When are corporate environmental policies a form of greenwashing? *Business & Society*, *44*, 377–414.

Ramus, C. A., & Steger, U. (2000). The roles of supervisory support behaviors and environmental policy in employee "ecoinitiatives" at leading-edge European companies. *Academy of Management Journal*, *43*, 605–626.

Redondo, J., Fraga, I., Padrón, I., & Comesaña, M. (2007). The Spanish adaptation of ANEW (affective norms for English words). *Behaviour Research Methods*, *39*, 600–605.

Rikhardsson, P., & Holm, C. (2008). The effect of environmental information on investment allocation decisions –an experimental study. *Business, Strategy and the Environment*, *17*, 382–397. https://doi.org/10.10002/bse.536

Sciarelli, M., Tani, M., Landi, G., & Turriziani, L. (2020). CSR perception and financial performance: Evidences from Italian and UKasset management companies. *Corporate Social Responsibility and Environmental Management*, *27*(2), 841–851.

Seele, P., & Gatti, L. (2017). Greenwashing revisited: In search of a typology and accusation-based definition incorporating legitimacy strategies. *Business Strategy and the Environment*, *26*, 239–252.

Sharma, S. (2000). Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. *Academy of Management Journal*, *43*, 681–697.

Sharma, S., & Vredenburg, H. (1998). Proactive corporate environmental strategy and the development of competitively valuable organizational capabilities. *Strategic Management Journal*, *19*(8), 729–753.

Siano, A., Vollero, A., Conte, F., & Amabile, S. (2017). More than words: Expanding the taxonomy of greenwashing after the Volkswagen scandal. *Journal of Business Research*, *71*, 27–37.

Skarmeas, D., & Leonidou, C. N. (2013). When consumers doubt, watch out! The role of CSR skepticism. *Journal of Business Research*, *66*, 1831–1838.

Smith, D. E., Skalnik, J. R., & Skalnik, P. C. (1999). Ethical behaviour of marketing managers and MBA students: A comparative study. *Teaching Business Ethics*, *3*, 323–337.

Szabo, S., & Webster, J. (2020). Perceived greenwashing: The effect of green marketing on environmental and product perceptions. *Journal of Business Ethics*. https://doi.org/10.1007/s10551-020-04461-0.

The New York Times. (2019, August 24). C.E.O. Pledge of Social Responsibility. The New York Times. Retrieved from https://www.nytimes.com/2019/08/24/opinion/letters/corporations-social-responsibility-business-roundtable.html

Torrelli, R., Balluchi, F., & Lazzini, A. (2020). Greenwashing and environmental communication: Effects on stakeholders' perceptions. *Business, Strategy and the Environment*, *29*, 407–421.

Velte, P. Environmental performance, carbon performance and earnings management: Empirical evidence for the European capital market. *Corporate Social Responsibility and Environmental Management*, 1–12. https://doi.org/10.1002/csr.2030.

Walker, K., & Wan, F. (2012). The harm of symbolic actions and greenwashing: Corporate actions and communications on environmental performance and their financial implications. *Journal of Business Ethics*, *109*, 227–242.

Wassmer, U., Paquin, R. L., & Sharma, S. (2012). The engagement of firms in environmental collaborations: Existing contributions and future directions. *Business & Society*, *53*, 754–786.

Weijters, B., & Baumgartner, H. (2012). Misresponse to reversed and negated items in surveys: A review. *Journal of Marketing Research*, *49*(5), 737–747.

Zollo, M., Cennamo, C., & Neumann, K. (2013). Beyond what and why understanding organizational evolution towards sustainable enterprise models. *Organization & Environment*, *26*, 241–259.

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APPENDIX A

Presented texts of MVV treatments on the stimulus

General corporate MVV treatment	Green MVV treatment
Since its establishment in 1956, the company has been guided by solid principles that have set its course. The company is committed to science as the basis of its growth, always taking into account the following principles for its decision making:	
• Our mission is the continuous generation of innovations that allow us to improve the efficiency of our clients. • Our vision is to be the leading company in the European chemical sector with the help of our innovative perspective. • Our values are honesty and integrity with our customers and respect for the people who work in the company.	• Our mission is the continuous generation of **environmental innovations** that allow us to improve the **eco-efficiency** of our clients and reduce the **impact** of their **ecological footprint.** • Our vision is to be the leading company in the European chemical sector due to our perspective based on **environmental innovations.** • Our values are the **sustainable development of the planet**, honesty, and integrity with our customers and respect for the people who work in the company.

APPENDIX B

Corporate General MVV

Green MVV.

Misión y visión

Desde su constitución en 1956, Nitrandalsa se ha guiado por unos sólidos principios que han marcado su rumbo. La empresa apuesta por la ciencia como base de su crecimiento teniendo siempre en cuenta para su toma de decisiones los siguientes principios:

1. Nuestra Misión es la generación continua de innovaciones medioambientales que permitan mejorar la ecoeficiencia de nuestros clientes y disminuir el impacto de su huella ecológica.

2. Nuestra Visión es ser la empresa líder en el sector químico europeo debido a nuestra perspectiva basada en las innovaciones medioambientales

3. Nuestros valores son el desarrollo sostenible del planeta, la honestidad y la integridad con nuestros clientes y el respeto por las personas que trabajan en la empresa

Positive news.

ESP | ANE | BRA | CAT | ENG NEWSLETTER SUSCRÍBETE

≡ El Informador Nacional ESPAÑA

Nitrandalsa, ganadora del premio "Desafío Química Verde 2019"

Madrid, 12 de noviembre de 2019

El concurso organizado por la Agencia de Protección Medioambiental Española (EPMS) dio por ganadora a la empresa Nitrandalsa por el desarrollo de un nuevo abono orgánico-mineral apto para la agricultura ecológica. Nitrandalsa ha superado holgadamente los requisitos establecidos por la EPMS para optar al premio en su categoria "empresa ecológica del año".

Para optar al premio "Desafío Química Verde" se debe obtener una calificación media superior al 80% en su grado de cumplimiento para las siguientes dimensiones analizadas: minimización de impactos y huella ecológica, mejora en ecoeficiencia, desarrollo de productos ecológicos y nivel de innovación medioambiental. Nitrandalsa obtuvo una calificación del 95% de cumplimiento.

La obtención de este galardón viene a reconocer el esfuerzo de las empresas químicas a la hora de desarrollar productos y procesos productivos respetuosos con el medio ambiente en una industria con un alto impacto medioambiental. Este premio tiene un reconocimiento internacional y otorga a las empresas ganadoras notoriedad internacional, distinguiendo a las ganadoras como empresas medioambientalmente responsables

Negative news.

ESP | ANE | BRA | CAT | ENG NEWSLETTER SUSCRÍBETE

≡ El Informador Nacional ESPAÑA

Nitrandalsa ha perdido frente a su competidor directo en el "Desafío Química Verde 2019"

Madrid, 12 de noviembre de 2019

El concurso organizado por la Agencia de Protección Medioambiental Española (EPMS) no dio por ganadora a la empresa Nitrandalsa en su edición actual. Nitrandalsa no ha superado los requisitos establecidos por la EPMS para optar al premio en su categoría "empresa ecológica del año".

Para optar al premio "Desafío Química Verde" se debe obtener una calificación media superior al 80% en su grado de cumplimiento para las siguientes dimensiones analizadas: minimización de impactos y huella ecológica, mejora en ecoeficiencia, desarrollo de productos ecológicos y nivel de innovación medioambiental. Nitrandalsa obtuvo una calificación inferior al 40% de cumplimiento.

La obtención de este galardón viene a reconocer el esfuerzo de las empresas químicas a la hora de desarrollar productos y procesos productivos respetuosos con el medio ambiente en una industria con un alto impacto medioambiental. Este premio tiene un reconocimiento internacional y otorga a las empresas ganadoras notoriedad internacional, distinguiendo a las ganadoras como empresas medioambientalmente responsables.

APPENDIX C

Presented texts of news treatments on the stimulus

Environmental performance treatment	
"Good"	**"Poor"**
"The company," winner of the "Green Chemical Challenge 2019"	**"The company" has lost to a direct competitor in the "Green Chemical Challenge 2019"**
The contest organized by the Spanish Environmental Protection Agency (EPMS) named the company "[name]"as the winner for the development of a new organic-mineral fertilizer suitable for organic farming. **The company has comfortably exceeded the requirements** established by the EPMS to qualify for the prize in its category "ecological company of the year." To qualify for the "green chemical challenge" award, an average rating of more than 80% must be obtained in the degree of compliance for the following analyzed dimensions: Minimization of impacts and ecological footprint, improvement in eco-efficiency, development of ecological products and level of environmental innovation. **The company obtained a 95% compliance rating.**	The contest organized by the Spanish Environmental Protection Agency (EPMS) did not name the company "[name]" as a winner in its current edition. **The company has not exceeded the requirements** established by the EPMS to qualify for the prize in its category "ecological company of the year." To qualify for the "green chemical challenge" award, an average rating of more than 80% must be obtained in the degree of compliance for the following analyzed dimensions: Minimization of impacts and ecological footprint, improvement in eco-efficiency, development of ecological products and level of environmental innovation. **The company obtained a rating below 40% compliance.**
Obtaining this award recognizes the efforts of chemical companies to develop products and productive processes that respect the environment in an industry with a high environmental impact. This award is internationally recognized and gives the winning companies international notoriety, distinguishing the winners as environmentally responsible companies.	